

**SAMPLING AND ANALYSIS PLAN
FOR THE
FORMER MUSICK PLATING SITE
EAST ST. LOUIS, ST. CLAIR COUNTY, ILLINOIS**

Field Cod

Prepared for
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region V

Prepared by
WESTON SOLUTIONS, INC.
Region V Superfund Technical Assessment and Response Team

August 20, 2007

Approved by: _____ Date: _____

U.S. EPA Region V
On-Scene Coordinator

Project Dates of Sampling:	8/22/2007
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Contractor Organization:	Weston Solutions, Inc.
Contract Name:	START III
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ACRONYM LIST

%	Percent
bgs	Below ground surface
CFR	Code of Federal Regulations
COC	Chain-of-Custody
ERB	Emergency Response Branch
ERRS	Emergency and Rapid Response Services
MeOH	Methanol
MS/MSD	Matrix Spike/ Matrix Spike Duplicate
NaHSO₄	Sodium bisulfate
OSC	On-Scene Coordinator
OSWER	Office of Solid Waste and Emergency Response
PPE	Personal Protective Equipment
QAPP	Quality Assurance Project Plan
QA/QC	Quality Assurance/Quality Control
RBC	Risk-Based Concentrations
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure
START	Superfund Technical Assessment and Response Team
SVOC	Semi-Volatile Organic Compound
TAL	Target Analyte List
TCL	Target Compound List
TCLP	Toxicity Characteristic Leaching Procedures
U.S. EPA	United States Environmental Protection Agency
VOA	Volatile Organic Analyte
VOC	Volatile Organic Compound
WDNR	Wisconsin Department of Natural Resources
WESTON	Weston Solutions, Inc.

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1.0 Introduction

This Sampling and Analysis Plan (SAP) identifies the data collection activities and associated quality assurance/quality control (QA/QC) measures specific to the Musick Plating Site (the Site) located in East St. Louis, St. Clair County, Illinois. All data will be generated in accordance with the quality requirements described in the *START III Generic QAPP*, dated June 2006. The purpose of this SAP is to describe site-specific tasks that will be performed in support of the stated objectives. The SAP will reference the Quality Assurance Project Plan (QAPP) for tasks common to all data collection activities including routine procedures for sampling and analysis, sample documentation, equipment decontamination, sample handling, data management, assessment and data review. Additional site-specific procedures and/or modifications to procedures described in the *START III Generic QAPP* are described in the following SAP elements.

This SAP is prepared, reviewed, and approved in accordance with the procedures detailed in the *START III Generic QAPP*. Any deviations or modifications to the approved SAP will be documented using **Table 1: SAP Revision Form**.

2.0 Project Management and SAP Distribution and Project Team Member List

Management of the Site will be as documented in the *START III Generic QAPP*. Refer to the *START III Generic QAPP* for an organizational chart, communication pathways, personnel responsibilities and qualifications, and special personnel training requirements.

The following personnel will be involved in planning and/or technical activities performed for this data collection activity. Each will receive a copy of the approved SAP. A copy of the SAP will also be retained in the Site file.

Personnel	Title	Organization	Phone Number	Email
Kevin Turner	OSC	U.S. EPA	618-525-3665	Turner.Kevin@epa.gov
Ben Maradkel	Project Manager	START	847-918-4084	ben.maradkel@westonsolutions.com
Tom Binz	Site Leader	START	314-581-0975	tbinz@pe-engrs.com
Bob Hill	Field Team Member	START	314-565-6956	bhill@pe-engrs.com
Ted Deecke	Health and Safety	START	847-337-4147	ted.deecke@westonsolutions.com
Pamela Bayles	QA Reviewer	START	847-918-4030	pamela.bayles@westonsolutions.com

NOTES:

OSC – On-Scene Coordinator

QA – Quality Assurance

START – Superfund Technical Assessment and Response Team

U.S. EPA – United States Environmental Protection Agency

3.0 Planning and Problem Definition

3.1 Problem Definition

The Site was referred to the United States Environmental Protection Agency (U.S. EPA) Region V Emergency Response Branch (ERB) by the Illinois Environmental Protection Agency (IEPA) on March 14, 2007. The Site is a former metal plating facility. Suspected threats to human health, welfare and the environment may be present on Site in the following forms:

- The agencies suspect plating chemical releases into the Site soil matrix from both historic operations and contact waters used for fire suppression. The City of East St. Louis Fire Department utilized significant amount of water for fire suppression purposes at the Site.
- The IEPA has observed sloppy work practices especially with regards to daily activities associated to the plating vats.
- While the facility has a perimeter fence surrounding the Site, the IEPA confirms that vandalism to a remnant metal building continues. Signs of trespassing at the Site have also been reported by the IEPA. For these reasons, the agencies have a concern with trespassers and vandals that may come into intimate contact with suspected contaminated soil present on site.
- The Site is situated in a mixed-use residential housing and light industrial setting.

3.2 Site History and Background

The IEPA requested assistance from the U.S. EPA Region 5 ERB to evaluate the potential threats to human health, welfare, and the environment posed by the Musick Plating facility located at 2133 Bond Avenue, East St. Louis, St. Clair County, Illinois. Details regarding the early history of the plating facility are vague at this time. IEPA reports that the earliest known plating operations date back to the mid-1960s.

Operations performed on site included cold plating for mixed-machined parts and metal corrosion-resistance plating. Approximately 80% of Musick's operations were comprised of nickel and chrome plating. The operation also performed a small amount of copper, zinc and cadmium plating as well.

In 2005, a suspicious fire destroyed mostly all of the Main Plating Building. Both prior to and after the fire, the IEPA had jurisdictional authority to conduct removal enforcement actions for remnant plating waste materials. The funding to conduct the IEPA lead removal operations came

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from the former owner/operators insurance company which subsidized the abatement and disposal of remnant asbestos building materials; disposal of fire damaged building debris; disposal of remnant drums and drum carcasses containing plating chemicals; and any remaining plating sludge's contained in the facility plating vats.

An abbreviated site compliance history timeline with the IEPA is present below.

- On September 20, 2004, the Site utilities were shut-off due to delinquent payment to local utility companies.
- On October 20, 2004, the IEPA conducted a site facility RCRA inspection and observed a variety of drummed plating waste materials, open plating vats that appeared to contain spent plating solutions and several hundred drums containing plating chemicals. As a result of that inspection, the IEPA observed conditions that resulted in up to 18 separate violations.
- On October 21, 2004, IEPA Director, Renee Cipriano, signed a Seal Order for the site. The Site was posted by the IEPA in order to restrict/control site access.
- On January 12, 2005, the IEPA issued an Immediate Injunction Order that was filed in St. Clair County Circuit Court against Musick Plating.
- On March 30, 2005 a fire consumed the Main Plating Building located in the southern center of the facility complex. IEPA was involved with waste removal activities that were well underway prior to the fire incident.
- On April 8, 2005, the Illinois Attorney Generals Office (IAGO), on behalf of the IEPA Bureau of Land, filed a Motion to Supplement Pleadings in St. Clair County Circuit Court and added a count for the release of asbestos due to the fire.
- On April 12, 2005, a Mandatory Injunction Order was obtained from the St. Clair County court requiring further clean-up of asbestos contaminated building materials as a result of the fire creating asbestos fiber releases.
- On July 6, 2005, the IAGO on behalf of the IEPA obtained a Contempt Order because owners of Musick Plating failed to comply with the April 12, 2005, Order. The Contempt Order required that the owners:
 1. Submit a work plan for demolishing to the Agency within 1 Business day.
 2. Provide and maintain 12 hour after-hours security starting at 7:00 p.m.
 3. Render all containers and vessels incapable of accumulating liquids within 2 days of the Order.
 4. Retain a contractor for demolition within 2 days.

5. Remove all asbestos within 10 days.
6. Remove all construction and demolition debris within 20 days.
7. Any salvageable steel must be decontaminated of asbestos.
8. Follow all other requirements of the April 12, 2005 Injunction Order.
9. Cease and desist any further operations.

At this time, The City of East St. Louis has yet to provide the IEPA a defined redevelopment plan that would incorporate the Musick Plating facility complex.

3.3 Contaminants of Concern/Target Analytes

According to IEPA, cyanide, chromium, zinc, nickel, caustics and acids were used on-site. These materials included: Chrome solution, acid copper plating solution, nickel sulfate solution, sodium hypo-chloride, zincates, nickel chloride solution, nickel plating solution, sodium hydroxide, cadmium solution, cyanide solution, potassium iodide, sodium succinate, zinc oxide, chromic acid, nitric acid, sulfuric acid, ammonium bisulfate and potassium cyanide.

To characterize the exact nature of Site contamination, the following parameters will be used to identify contaminants of concern: Toxicity Characteristic Leaching Procedure (TCLP) Resource Conservation and Recovery Act (RCRA) metals; total RCRA metals; and total cyanide.

4.0 Project Description and Schedule

U.S. EPA and the Weston Solutions, Inc. (WESTON) Superfund Technical Assessment and Response Team (START) will mobilize to the Site on August 22, 2007 to perform a site assessment. The site assessment will consist of those tasks necessary to document and characterize threats posed to human health, welfare, and the environment at the Site. Specifically, the following tasks will be performed:

- Site reconnaissance, including a radiation survey and determination of sampling locations by the use of a hand-held Niton x-ray fluorescence (XRF) metals analyzer;
- Site soil and/or sediment sampling using either a hand auger or by the IEPA owned/operated Geo-Probe unit.

START will collect from twelve (12) to twenty (20) soil samples (plus QC samples) from various locations on Site as identified by the OSC in concert with representatives from the IEPA. A XRF field screening instrument will be used to pre-screen both surface and subsurface soil samples. If impacted soil is noted, up to three soil samples, collected from the soil surface to 48 inches below ground surface (bgs).

A U.S. EPA-approved commercial laboratory will provide analytical services. START will provide

sample coordination including laboratory procurement and sample shipment. Sample labels and chain-of-custody (COC) paperwork will be generated by START. Samples will be packaged properly by START and delivered to the laboratory. The turn-around time for the sample data will be a standard 14 days. The samples will be reviewed and validated by a START chemist within two weeks of data receipt from the laboratory. A summary report of the sampling results will be submitted to U.S. EPA within two weeks of receipt of the validated data.

5.0 Project Quality Objectives

5.1 Project Objectives

The objective of sampling activities is to determine if the material at the site poses a threat to human health, welfare, and the environment.

The objectives for this investigation include:

- Identify the constituents and/or characteristic properties of plating chemicals or plating waster material present in surface soils.
- Determine if a removal action is warranted based on National Contingency Plan criteria and, if so, whether the response should be classified as emergency, time-critical, or non-time critical;
- Rapidly assess and evaluate the urgency, magnitude, extent, and effects of a release, or threatened release, of hazardous substances, pollutants or contaminants identified and their affects on human health and/or the environment;
- Supply the Agency for Toxic Substances and Disease Registry or others with information about the nature and magnitude of any health threats associated with the identified threats;
- Support subsequent public health advisories; and
- Determine a remedy to eliminate, reduce, or control risks to human health and the environment and to support an Action Memorandum documenting the identified removal approach.

5.2 Measurement and Performance Criteria

Generic measurement and performance criteria described in the *START III Generic QAPP* will be used to ensure that data are sufficiently sensitive, precise, accurate, and representative to support site decisions.

5.3 Data Quality Objectives

Data quality objectives address requirements that include when, where, and how to collect samples, the number of samples, and the limits on tolerable error rates. These steps should periodically be revisited as new information about a problem is learned.

The sampling results for both total metals and TCLP for all RCRA 8 heavy metals, and total cyanides will be compared to the hazardous waste criteria outlined in 40 Code of Federal Regulations (CFR), Part 261 to determine whether an emergency response is needed pursuant to 40 CFR Part 300. The sampling results for the 8 total RCRA heavy metals and TCLP metals in soil and sediment will be compared to the U.S. EPA Region III Risk-Based Concentrations (RBCs); Region IV Preliminary Remediation Goals 9 (PRGs) and the IEPA Tiered Approach to Corrective Actions Objectives (TACO).

6.0 Sampling Design

6.1 Sample Collection

START will collect soil samples from surface and subsurface locations as directed by the OSC. The locations of the samples will be determined when the field team arrives on Site. The collection of each sample type is described below.

- **Soil Sampling.** Up to 20 soil grab samples will be collected and sent to the laboratory for analysis. The soil samples will be collected from the 0 to 48 inches bgs and from up to three sampling locations. The sampling procedures will be consistent with the soil sampling procedure identified in the WESTON Standard Operating Procedure (SOP) S3-001 – Surface and Subsurface Soil Sampling. The soil sampling procedures are described below in chronological order.
 - Using a scoop (or equivalent), surface soil be removed from the ground to expose the soil.
 - Surface soil (0-48 inches bgs) will be collected using a hand auger (or equivalent) and placed in an aluminum pan.
 - Using a disposable scoop, the sample will be homogenized in the pan and each sample container filled with soil.
 - The hand auger and associated non-dedicated equipment that contacts the samples will be decontaminated between sample collections in accordance with the requirements outlined in Subsection 7.3 of this SAP.

Soil samples will be analyzed for RCRA 8 heavy metals TCLP, RCRA 8 heavy metals Totals and Total cyanide. The sample container, volume, and preservation requirements are presented in **Table**

2: Sampling Locations and Sampling and Analysis Summary/Field Quality Control Summary.

6.2 Sample Numbering System

All samples for analysis, including QC samples, will be given a unique sample number. The sample numbers will be recorded in the field logbook, the COC paperwork, and the shipment documents.

START will assign each sample a project sample number. The project sample number highlights the suspected contaminated area and location, and will be used for documentation purposes in field logbooks, as well as for presentation of the analytical data in memoranda and reports. The project sample numbering system will be composed of the components below.

Project Identifier

The first part of the project sample numbering system will be the two-character designation MP. MP corresponds to Musick Plating Site.

Sample Date

This shall consist of a six digit date (*i.e.*, 082207) for August 22, 2007.

Matrix

This shall consist of one to three letters identifying the matrix. These matrix identifiers are as follows:

S – Soil
SE – Sediment
WL – Waste Liquid
WS – Waste Solid

Please note that START does not anticipate the collections of any containerized waste materials or waste liquids for the Musick Plating Site Assessment. The above listed identifiers are provided as a contingency if other sampling media are encountered during the course of site reconnaissance and field sampling activities.

Sequence Identifier

This shall consist of the following:

- A two-digit sequence number that tracks the number of samples collected from the Site. Sequence 01 refers to the first sample, and sequence 02 refers to the second sample.

- If the sample is a field duplicate sample, DP will be added to the end of the sample ID.
- For field and trip blanks, the two-digit sequence number will denote the sequential number of field or trip blank samples collected for that sample type.

Some examples of the START project sample numbering system are as follows:

- MP-S01-082207-DP: Musick Plating; first soil sample collected on August 22, 2007; duplicate.
- MP-S02-082207: Musick Plating; second soil sample collected on August 22, 2007.

6.3 Management of Investigation-Derived Wastes

For purposes of this SAP, investigation-derived wastes are defined as any byproduct of the field activities that is suspected or known to be contaminated with hazardous substances. The performance of field activities will produce waste products, such as spent sampling supplies (e.g., bailers, drum thieves, spoons), and expendable Personal Protective Equipment (PPE). Note that disposable equipment will be used for all sample collection, and therefore, no decontamination water will be generated. All waste generated during the site assessment will be placed in trash bags and left on Site in a staging area with U.S. EPA approval. If required, disposal arrangements will be executed in accordance with appropriate local, state, or federal regulations. START will refer to the U.S. EPA's *Management of Investigation-Derived Wastes During Site Inspections* (U.S. EPA, 1991) guidance for off-site disposal policies, if this action is deemed necessary.

7.0 Sampling Procedures

7.1 Sampling Standard Operating Procedures

The following SOPs will be used during the site assessment:

- S3-001 – Surface and Subsurface Soil Sampling.

7.2 Decontamination Procedures

General decontamination procedures are described in Section B.2 of the *START III Generic QAPP*. The following standard decontamination protocols will be used:

- Dry decontamination procedures will be utilized to the extent practicable for surface soils.

- All disposable sampling supplies and PPE will be bagged, labeled, and sealed with duct tape.
- Wet decontamination procedures will be utilized for all samples collected via the hand auger.

8.0 Sample Handling, Tracking, and Custody Procedures

All samples will be identified, handled, shipped, tracked, and maintained under COC, in accordance with *START III Generic QAPP* Section B.3.

9.0 Field Analytical Methods and Procedures

9.1 Field Analytical Methods and Standard Operating Procedures

There will be no field analytical methods used during the site assessment.

9.2 Field Testing Laboratory

START does not anticipate the use of any field sampling activities at this time.

9.3 Screening/Confirmatory Analyses

XRF field screening techniques will be used as a high-biased soil sampling approach. START will place a Niton XRFTM directly onto surface soils or onto aluminum pans containing subsurface soils collected by the Geo-probe split-spoon sampling device or disposable liners.

10.0 Fixed Laboratory Analytical Methods and Procedures

A U.S. EPA-certified commercial laboratory will be used. The laboratory name, address, contact person, telephone number, and fax number are as follows:

Tek-Lab, Inc.
5445 Horseshoe Lake Rd.
Collinsville, IL 62234
Contact: Shelly Hennessy
(618) 344-1004

The laboratory analytical methods and procedures are detailed in Table 2 of this SAP.

11.0 Quality Control Activities

11.1 Field Quality Control

Field QC samples will be collected and analyzed for this project at the frequency described in *START III Generic QAPP*, Table 4. The number of QC samples collected for each analytical parameter and concentration level are listed in **Table 2: Sampling Locations and Sampling and Analysis Summary/Field Quality Control Summary**.

11.2 Analytical Quality Control

QC for analytical procedures will be performed at the frequency described in *START III Generic QAPP*, Tables 5 and 6. In addition, method-specific QC requirements will be used to ensure data quality.

11.3 Performance Evaluation Samples

Performance Evaluation Samples will not be collected during this sampling event.

12.0 Documentation, Records, and Data Management

Documentation, record keeping, and data management activities will be conducted in accordance with the *START III Generic QAPP*, Section B.10.

13.0 Quality Assurance Assessment and Corrective Actions

No field audits will be conducted due to the short-term (1 day) sampling activity.

14.0 Reports to Management

Reports to management will be written and distributed in accordance with the *START III Generic QAPP*, Section C.

15.0 Steps 1, 2 and 3: Data Review Requirements and Procedures

Step 1: Data collection activities, including sample collection and data generation, will be verified in accordance with the *START III Generic QAPP*, Section D.

Step 2: Data will be validated in accordance with the *START III Generic QAPP*, Section D.
A START chemist will validate the data.

Step 3: Data will be reviewed for usability in accordance with the *START III Generic QAPP*, Section D.

Table 1
SAP Revision Form

Site: Musick Plating Site, East St. Louis, St. Clair County, Illinois

OSC: Kevin Turner

TDD: S05-0708-010 – Labor only
 S05-0708-011 – Laboratory only

Date	Rev. No.	Proposed Change to SAP/QAPP	Reason for Change of Scope/Procedures	SAP Section Superseded	Requested By	Approved By

NOTES:

No. – Number

OSC – On-Scene Coordinator

QAPP – Quality Assurance Project Plan

Rev. – Revision

SAP – Sampling and Analysis Plan

TDD – Technical Directive Document

Table 2
Sampling Locations and Sampling and Analysis Summary / Field Quality Control Summary

Site: Musick Plating Site, East St. Louis, St. Clair County, Illinois

OSC: Kevin Turner

TDD: S05-0708-010 – Labor only

S05-0708-011 – Laboratory only

Matrix	Analytical Parameter	Analytical Method (SW-846)	Containers (Numbers, Size, and Type)	Preservation Requirements	No. of Sampling Locations	No. of Field Duplicate Pairs	No. of MS/MSD or Spike / Duplicates	No. of VOA Trip Blanks	No. of Equip./Rinsate Blanks	Total No. of Samples to Lab
Soil and/or Sediment	TCLP RCRA Metals	1311/6010/7470	(1) 4-oz. G wide-mouth jar	Ice, Cool to 4°C	12 - 20	2	1	0	0	14 - 22
	Totals Cyanide	9012A	(1) 4-oz G wide-mouth jar	Ice, Cool to 4°C	12 - 20	2	1	0	1	15 - 23
	Total RCRA Metals	6010 and 7471	(1) 4-oz G wide-mouth jar	Ice, Cool to 4°C	12 - 20	2	1	0	1	15 - 23

NOTES:

Trip blanks are only required for VOCs in water samples.

Total number of samples to the laboratory includes MS/MSD or spike/duplicate samples.

°C – Degrees Celsius

Equip. – Equipment

G – Glass

MS/MSD – Matrix Spike/Matrix Spike Duplicate

No. – Number

Oz – Ounce

RCRA – Resource Conservation and Recovery Act

TCLP – Toxicity Characteristic Leaching Procedure